Skyscraper Is Becoming More Like a Human Being

Something About Kearns Building

Of the thousands of people who traverse Main street every day and who pass the skyscraper being erected by Thomas Kearns, practically every one stops a moment to watch the skilled workmen placing the enameled terra cotta in position on the giant steel frame of the great building and which when completed will be the most beautiful front upon any building in the West and as handsome as any in the country. Many have watched the workmen from the beginning until the great steel frame which points skyward was finished.

While a well-known builder and a Tribune representative were looking over the work and commenting upon the splendid building, the builder said: "You often hear it said that an engineer learns to love his engine and a captain his ship, but did you ever think how one who designs or erects a building watches its progress and learns to love it more and more as it grows under his care, just as a mother watches and cares for her child, for in many respects it is like a child. It grows up day by day under someone's direction. In its early days it is easy to change its shape or character but after a while it is difficult, if not impossible, to do so. It is the same way with the child.

"At first a building is watched with interest as the work progresses. After it is completed it becomes less interesting until it grows old and the space is wanted for a new and modern building, when it is removed or destroyed, no matter how successful it has been in the past. Just as the child is watched and admired, but after many long years of hard and faithful work, the poor, old man is told that a younger one is to take his place and he is removed.

"In its construction the modern building is becoming more like a human being as new ideas are being carried out. The steel beams and columns are its bones, the rods and wires its muscles and cords, the brick and terra cotta coverings its skin and the windows its eyes. Down in the basement the engine throbs away stroke after stroke, forcing steam and water throughout to heat and cleanse the building, just as our hearts do in our bodies, and the great fans drawing in the pure air and sending it through pipes to the different rooms correspond to our lungs and do practically the same work. The electric wires are the nerves connecting with the main office which correspond to the brain, from which the entire system is controlled and governed. The great quantity of coal used in the furnace is the food which provides the power to keep all things moving. And other comparisons could be made almost indefinitely.

"Now you and I are alike," continued the gentleman, "and there are thousands more just like us who would like to know something about this great building, something about steel construction of buildings—in other words, why don't you tell us about the framework and the dress of this giant steel child? It would interest you and I and hundreds and thousands of others." The suggestion was adopted by The Tribune representative. Here is what he learned about the great big steel child and other facts in connection with the construction of fireproof buildings of the present day.

Fireproof Construction.

Previous to the beginning of the nineteenth century little attention had been given to making buildings fireproof. Some attempts had been made in public buildings but they were crude and consisted in most cases of brick walls supporting brick arches which formed the floors and roof similar to a large vault. It was early in the nineteenth century when a slight improvement was made by supporting these floors on cast iron beams resting on the brick walls. Another improvement was made and these beams were supported on cast iron columns making it possible to form larger rooms. As long as buildings were only two or three stories high, this was all that was necessary, but as ground values increased in our large cities and elevators were introduced architects and engineers looked for a method that would allow of higher buildings.

Up to the time of the great Chicago fire, fireproofing iron columns or girders, except in a few cases, was not considered necessary. But this fire proved to all who were interested that although iron would not burn, it would, when heated, bend and buckle allowing walls and floors to fall.

In the year 1883, Mr. W. L. B. Jenney, a Chicago architect, first used the present skeleton construction in the Home Insurance company's building. Previous to this, it was the custom to carry the interior floor loads on cast iron columns, these columns resting upon each other at each floor and being bolted together, the outside walls carrying the outer part of floors. In the above building, the windows were required to be very wide; this reduced the size and strength of the piers and it was necessary to put columns in the piers to carry the floor load. It was then found that columns a hundred feet high or over built into self-supporting brick walls, caused trouble as the brick would settle several inches and the columns would not. Another change was made and these columns were arranged to carry not only the floors but by putting iron beams at each floor to carry the walls and the settlement was distributed. This is practically the condition of our present system of skeleton construction as used in the Kearns building and the Hotel Utah, now being built here.

First Rolled Iron Beams.

The first rolled iron beams were used in the United States about the year 1850, cast iron beams being used before. It was not until the year 1885 that steel beams were used, so that the change from the old-fashioned brick arches resting on the brick walls to the use of steel beams in skeleton construction as now took place in less than seventy-five years. Steel construction is here to stay, but no doubt great improvements will be made in the methods of using it. Reinforced concrete will not take the place of steel construction but the two will be used together and the best engineers and architects now consider the requirements of the building and use each material where it serves the purpose best.

The Kearns building is a splendid example of steel construction. However, the foundations are of reinforced concrete and the floors are of the same material. The fireproof material is tile, every partition being made of hollow tile.

As to Concrete.

Now a word about concrete, cement construction. Two thousand years ago, to be exact, 27 B. C., M. Sipeanius Agnippa erected the Pantheon, a temple in ancient Rome. It was erected in honor of Mars and Venus. Today it is known as the Church of Santa Maria Rotonda and is used as a burial place for great Italians. Covering this ancient temple is a hemispherical cement concrete dome spanning 142 feet and 6 inches in the clear. This dome is as good today as when built with but a single crack visible and is the most wonderful monument in the world to the strength and durability of concrete construction. It is in fact the first piece of all concrete construction in the history of the world. The first cement made in the United States was in 1823 and the place of manufacture near Rosendale, N. Y. This was hydraulic cement, or as it is often called Rosendale cement. This cement was building or calcerous cement.

Why Cement Is Used.

Slaked lime with enough extra water to form a paste and an admixture of sand to prevent shrinkage and drying constitutes as everyone knows the lime mortar which has been used since ancient times in laying up all brick and stone masonry. The weak points of lime mortar are that the absorption of carbon dioxide goes on very slowly and cannot proceed at all under water. These deficiences are responsible for the enormous consumption of cement as it has been found in tearing down very thick walls of considerable age that the mortar in the interior was still unhardened, the carbon dioxide not having been able to penetrate to the interior. Now no foundation wall is laid with lime mortar, cement mortar being used. During the last twenty years the use of cement has attained a marvelous growth, surpassed only by coal, steel and iron and keeping close pace with these.

About Terra Cotta.

This term, terra cotta, as now commonly used includes those clay products used for structural or decorative work and which, owing to size or form cannot be moulded by machinery, but have to be shaped by hand. The name terra cotta has, however, also been applied to many burned clay busts, statuettes and even vases made by the ancients, notably the Greeks, which, however, are to be classed as earthenware pottery. Terra cotta is made from a mixture of clays of refractory or semi-refractory character, they being used because of their burning qualities and resistance to heat in burning. It is usually pressed by hand in plaster moulds but complicated shapes like those on the Kearns building have to be modeled free hand. Great care is necessary in drying and burning the ware in order to prevent cracking and warping and large designs, like those on the Kearns building, have to be made and burned in several parts and afterwards fitted together. The designs for this building were made, moulded and burned in Lincoln, California. The burning is done in muffle kilns. The success of terra cotta for exterior decoration has met with remarkable success. Architectural tileing consisting of terra cotta body covered with a bright glaze or matte surface, the kind used on the Kearns building, is now being produced by several potteries. Much of the Della Robbia work, made in the fifteenth century, is of this type. Much of the terra cotta is covered with a slip—a mixture of kaolin, ball-clay, quartz and feldspar with coloring matter added is sprayed onto the unburned ware.

About the Kearns Building.

Now to go back to the Kearns building. Parkinson & Berkstrom are the architects, as they are also for the Utah hotel, while George Curley of Salt Lake is the general contractor.

To create the framework of this great structure, this steel doll as it were, required 1850 tons of steel, three million seven hundred thousand pounds, 62 carloads or four train loads. Were these steel beams placed end to end they would reach twelve miles. To fasten these beams and columns together necessitated the use of 150,000 rivets and were these rivets placed end to end they would extend a distance of six miles. In other words there are eighteen miles of steel in the building. Were all this steel piled up in a heap so that it could easily be carried away, there would be 50 pounds of steel for every man, woman and child in Salt Lake City and there would still be left a big pile not touched. This is what the framework of this big steel doll is composed of.

Dressing Steel Doll.

Now it must be dressed. The outer covering, the skin of terra cotta and brick, must be put on. Each piece of terra cotta which makes the front skin of the building has been made by hand. Each piece was made in a special mould and is numbered for its particular place. Every scroll, every bracket, every ornament was especially designed for this building, hence it sets a fashion of its own that cannot be duplicated. This is the front.

On the side and end walls brick will furnish the skin. These brick are Utah made and burned in the largest brick kiln in the world. One million six hundred thousand brick will be used—this is 1000 wagon loads. Were these wagons started from the kilns of the Salt Lake Pressed Brick company, who furnish the brick, there would be a procession of wagons and horses six miles in length and were the bricks placed end to end they would reach over 200 miles.

The partition walls are made of hollow tile which tile is also Utah made and every beam and column is fire-proofed with this tile which is 12x12 inches and four inches thick. This tile, of course, will not only not burn, but it protects the steel beams and columns from warping in case of fire. Were these pieces of tile placed end to end they would extend a distance of ten miles. It might be mentioned here that in the Baltimore, Boston and San Francisco fires no material proved so near fire-proof as clay products, although concrete likewise made good when secured to steel beams and columns in substantial way.

Add to all this the miles of telegraph, telephone and electric wires and the miles of water pipe used in this great skyscraper and you have a faint conception of what it takes and what it costs to dress this big steel doll. Then when the army of men employed in factory and foundery and yard besides the army now employed on the structure and then again one has a faint idea of the cost of this great steel fireproof skyscraper which, when finished and ready for occupancy, including the ground, will necessitate an outlay of one and a quarter million dollars.

It might be added here that all the material used in this skyscraper was in its native state four years ago, that every beam and every column in this skyscraper had a special drawing made for it, showing all connections, exact length and where every rivet hole is. It is the first building ever erected in Salt Lake where two shifts of men have been employed in the work, one shift working from 4 o'clock a. m. to 12 o'clock noon; the other from 12 noon to 8 o'clock p. m.